

**REMARKS**

Claims 1-25 are pending in this application. Claims 5-10, 12-15 and 21-25 have been allowed. Claims 1-4, 11 and 16-20 have been rejected.

**35 USC § 102(e) Rejections**

Claim 1-4 and 11 are rejected under 35 USC 102(e) as being anticipated by Smith et al. (US Patent 2003/0063884 A1).

The present invention is an optical function device. As illustrated in the first embodiment shown in Figure 1 this optical function device is made of a substrate layer (1) on which is placed a lower electrode (2). On the lower electrode layer (2) is placed a lower clad layer (3) and then a core layer (10). The core layer (10) is made of columns (4) and a filler (5). On the core layer (10) is placed a upper clad layer (6) and thereafter an upper electrode (7).

Smith et al. describes rectangular, multi-mode, self imaging waveguide technology in which as illustrated in Figure 16 the waveguide (160) includes a core (162) sandwiched between two cladding layers (164, 166).

Claim 1 has been amended by incorporating “wherein an effective refractive index of said clad layer is smaller than an effective refractive index of said core layer”. Smith et al. fails to disclose this feature. Therefore, claim 1 patentably distinguishes over the prior art relied upon by reciting,

“An optical function device comprising: a core layer containing photonic crystals formed by ferroelectric members made of a ferroelectric substance and

periodically disposed along a one-dimensional direction or two-dimensional directions; electrodes for applying an electric field to the core layer; and a clad layer disposed on both sides of the core layer containing photonic crystals formed by ferroelectric members made of a ferroelectric substance and periodically disposed along a one-dimensional direction or two-dimensional directions, wherein an effective refractive index of said clad layer is smaller than an effective refractive index of said core layer.” (Emphasis Added)

Therefore, withdrawal of the rejection of claims 1-4 and 11 under 35 USC 102(e) as being anticipated by Smith et al. (US Patent 2003/0063884 A1) is respectfully requested.

### **35 USC § 103(a) Rejections**

Claims 16-20 are rejected under 35 USC 103(a) as being unpatentable over Jasper et al. (US Patent 5,739,796 A), in view of Smith et al. (US Patent 2003/0063884 A1).

Jasper et al. describes a photonic band gap crystal. As illustrated in Figure 3 the crystal has a number of equal length dielectric rods (2) which are disposed within a host material (11).

Claim 16 also incorporates the phrase “wherein an effective refractive index of said clad layer is smaller than an effective refractive index of said core layer”. Applicants believe this language overcomes the rejection of Claim 16 as being not patentable. Therefore, claim 16 patentably distinguishes over the prior art relied upon by reciting,

“An optical function device comprising: a core layer including a first member disposed periodically along a one-dimensional direction or two-dimensional directions and a second member filled in between the first members, the first and second members constituting a photonic crystal, and at least one of the first and second members being made of a substance having a character that a refractive index is changed upon generation of an electric field; electrodes for applying an electric field to the core layer; and a clad layer disposed on both sides of the core layer

containing photonic crystals formed by ferroelectric members made of a ferroelectric substance and periodically disposed along a one-dimensional direction or two-dimensional directions, wherein an effective refractive index of said clad layer is smaller than an effective refractive index of said core layer.” (Emphasis Added)

Therefore, withdrawal of the rejection of claims 16-20 under 35 USC 103(a) are being unpatentable over Jasper et al. (US Patent 5,739,796 A), in view of Smith et al. (US Patent 2003/0063884 A1) is respectfully requested.

### Conclusion

In view of the aforementioned amendments and accompanying remarks, claims 1-25, as amended, are believed to be patentable and in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 10/804,061  
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In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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